REMARKS

. Claims 8-22 are now pending in this application. Claims 8-20 are

rejected. Claims 1-7 are previously cancelled. New claims 21-22 are added.

Claims 8, 10 and 18 are amended herein to clarify the invention. Claims 14-17

are amended to maintain proper antecedent language.

Applicants respectfully submit that, upon entry of the subject amendment,

the application will be in condition for allowance. Applicants, thus, respectfully

request consideration of the above amendment and the following remarks.

The Subject Matter of the Claimed Inventions

The claimed inventions are directed to a method and apparatus for

processing a surface of a substrate with an ion beam. The substrate surface has

know property patterns. A new property pattern is achieved by processing the

surface with the ion beam.

Of significance is that the ion beam has local ion current density

distributions, (Original specification at paragraph 20). In particular, the ion

current density distribution may differ locally at different portions of the ion beam

cross section. The modification of those ion current density distributions locally

enables more precise processing of the substrate surface to achieve the desired

new property pattern. Accordingly, the local ion current density distributions are

modified and adapted so that corresponding ion energy distributions at a substrate

surface are correspondingly modified and adapted. In contrast, it is submitted that the art of record requires that the entire beam be modified, i.e., the entire cross section profile of the beam is changed.

An ion probe array measures a current geometric action pattern of the ion beam. The geometric action pattern of the ion beam is adjusted based on the measured geometric action pattern and the known pattern of properties of the substrate surface. Such adjustment includes varying local ion current density distributions within an ion beam cross section to cause a corresponding variation of ion energy distribution at defined surface area regions of the substrate that ions of the ion beam act upon.

Prior art Rejections and the Cited Art

Claims 8, 9, 11 and 12 are rejected under 35 USC 102(b) as being anticipated by U.S. Patent No. 3,699,334 (Cohen et al.).

Claims 18 and 20 are 12 are rejected under 35 USC 102(b) as being anticipated by U.S. Patent No. 5,223,109 (Itoh et al.).

Claims 10 and 13 are rejected under 35 USC 103(a) as being unpatentable over Cohen et al. in view of U.S. Patent No. 6,809,066 (Reade et al.) or European Patent EP 1 253 619 (Muraki et al.).

Claims 15 and 17 are rejected under 35 USC 103(a) as being unpatentable over Cohen et al. in view of Reade et al. or Muraki et al., and further in view of U.S. Patent No. 6,274,007 (Smirnov et al.).

Cohen et al. disclose ion beam apparatus for erosion of surfaces. An interferometer may monitor the erosion process (col. 3, lines 9-10). The ion beam appears to have uniform Gaussian density distribution, (See col. 4, lines 27-34).

Itoh et al. disclose an ion beam processing method and apparatus, including workpiece tables for x-axis, y-axis and z-axis positions of the workpiece.

Reade et al. disclose using multiple ion beams to increase the degree of texture of a surface., (Col. 3, lines 37-40). The multiple beams can be simultaneously active, or used in sequence, (Col. 4, lines 4-10).

Muraki et al. disclose a beam source in which an electron beam passes through an aperture array AA, deflector array DA, lens array LA, blanker array BA, and a correction lens array CLA in sequence, (Paragraph 0024) to form multiple beams.

Smirnov et al. disclose a method of forming silicon nanostructures in which an ion probe is positioned on a sample surface (col. 5, lines 1-5).

The Claims Distinguished

Claims 8 and 18 are in independent format. Claims 8 and 18

distinguish over the cited art based at least upon the following claim limitations:

- **adjusting the geometric action pattern of said ion beam based on**

the measured geometric action pattern and the known pattern of properties,

said adjusting comprising **varying local ion current density distributions**

within an ion beam cross section, thereby causing a corresponding variation of

ion energy distribution at defined surface area regions of the substrate that ions

of the ion beam act upon.

It is respectfully submitted that the cited art does not disclose adjusting a

geometric action pattern of an ion beam based on both a measured geometric

action pattern and a substrate surface's known pattern of properties to achieve a

new set of properties. Further, it is respectfully submitted that the cited art

does not disclose achieving such adjusting by varying current density

distributions of an ion beam. In particular, the plurality of current density

distributions of the ion beam indicates that the ion current density distributions

vary within an ion beam cross section. The cited art does not disclose varying

ion current density distributions occurring at various portions of an ion beam

cross section. Such variations cause corresponding variations of ion energy

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distribution at defined surface area regions of the substrate that allows for

precise erosion of surfaces.

Claims 9-17, and 22 ultimately depend from claim 8, and distinguish

over the cited art based at least on the same reasons as discussed for claim 8.

Claims 19-20 ultimately depend from claim 18, and distinguish over the

cited art based at least on the same reasons as discussed for claim 18.

CLAIM FEES

An additional claim is added. **The fee of $52 for the claim(s) is**

provided for in the charge authorization presented in the PTO Form 2038,

Credit Card Payment form, provided herewith.

REQUEST FOR EXTENSION OF TIME

Applicants respectfully request a two month extension of time for

responding to the Office Action. **The fee of $490 for the extension is provided**

for in the charge authorization presented in the PTO Form 2038, Credit

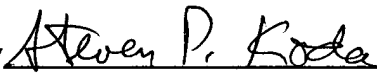**Card Payment form, provided herewith.**

If there is any discrepancy between the fee(s) due and the fee payment

authorized in the Credit Card Payment Form PTO-2038 or the Form PTO-2038

is missing or fee payment via the Form PTO-2038 cannot be processed, the

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USPTO is hereby authorized to charge any fee(s) or fee(s) deficiency or credit any excess payment to Deposit Account No. 10-1250.
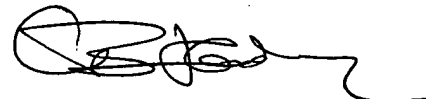
In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,
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